REMARKS

Claims 1-37 are pending in this Application. Claims 1-5, 8-11, 13-22 and 24-36 have been rejected and claims 6, 7, 12, 23 and 37 have been objected to. It appears that claim 31 has been neither rejected nor objected to. No claims are amended. The Examiner is respectfully requested to reconsider all rejections in light of the following remarks.

The Examiner is thanked for a careful review and analysis of the claims, including each of the dependent claims. The indication of allowable subject matter is gratefully acknowledged.

Rejections Under 35 U.S.C § 102

Claims 1-5, 8-11, 13-22, 24-30 and 32-36 stand rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,444,715 to Mukherjee et al. ("Mukherjee"). The cited patent has been considered and it is respectfully submitted that it does not prevent patenting of the claims.

Independent claims 1, 26 and 32 each recite methods of preparing a porous low-k dielectric material comprising at least two operations: 1) providing a precursor film on a substrate and 2) exposing the precursor film to ultraviolet radiation. The precursor film comprises a porogen and a structure former. In one embodiment described in the specification, the structure former serves as a backbone of the dielectric matrix and the porogen is removable material that defines void regions in a dielectric matrix. In specific embodiments, the porogen comprises organic material and the structure former comprises silicon and oxygen. Exposing the precursor film to ultraviolet radiation (second operation) facilitates removal of porogen from the precursor film, thereby leaving a porous low-k dielectric material.

Mukherjee describes methods for producing nanoporous materials using a nanoporous aerogel in combination with a blending material. The nanoporous aerogel 120, a porous material in powder, gel or film form (col. 7, lines 15-19), is combined with blending material 130 to form an amalgamation layer 150. The blending material 130 comprises a reinforcing component 136 and a volatile component 138. The volatile component 138 is a polar or non-polar solvent such as water, one of various alcohols, or one of various organic solvents (col. 8, lines 29-38). The reinforcing component 136 can be a polymeric or monomeric material. The amalgamation layer 150 is treated with heat and/or pressure to remove the volatile component

138 (col. 9, lines 9-29), leaving the nanoporous aerogel 120 and reinforcing component 136. The resulting material is referred to as dielectric material 100.

First, in considering the rejection of claim 1 and the other independent claims, Applicants can discern no feature described in the Mukherjee patent that would qualify as a porogen within the meaning the claimed invention. Possibly the office considers the aerogel precursor to contain a porogen. Alternatively, possibly the Office considers the "volatile component" of the "blending material" to be a porogen.

The aerogel precursor is used from a nanoporous aerogel that includes pores 125. See Figures 1 and 2. It is not entirely clear how these pores were formed. Most likely they are formed by supercritical extraction as mentioned in the Mukherjee patent at column 4, lines 14-17. More generally, see the discussion in column 6, line 5 through column 7, line 28. In this discussion of the formation of the nanoporous aerogel, there is no mention of the treatment with ultraviolet radiation or even any mention of ultraviolet radiation for any purpose. Certainly, ultraviolet radiation is not identified as a treatment that would facilitate formation of pores in the nanoporous aerogel.

Before discussing other possible components of the Mukherjee structure that might qualify as a porogen, it is worth detailing the overall process described in the Mukherjee patent. The nanoporous aerogel is combined with a "blending material" that includes (a) a reinforcing component and (b) a volatile component. The reinforcing component includes various polymers and monomers. See column 7, line 29, to column 10, line 14. The volatile component is identified as any one of various small molecular weight solvents. See column 8, lines 29-38.

In the Mukherjee process, the blending material is combined into the nanoporous aerogel, permeating into the pores of the aerogel. See column 8, line 39 to column 9, line 7. Thereafter, the process removes the volatile component from the blending material. See column 9, lines 9-29. Note that to remove the volatile component of the blending material, procedures such as application of heat and/or pressure are identified. There is no suggestion that ultraviolet radiation may be employed to facilitate this process. Further, there is no suggestion that pores will result in the blending material after the volatile component is removed. Given the small

molecule weight solvents identified in by Mukherjee as volatile components, one would not expect pores to be formed upon removal of the volatile component from the blending material.

A complete search of the Mukherjee specification revealed that the terms "UV' or "ultraviolet" appear only twice, once in the paragraph at column 10, lines 3-31 and again in identical paragraph appearing at column 11, lines 31-50. At these locations, "UV-irradiation" is used for the purpose of a final "curing" to form a polymer structure. It is important to understand that UV radiation is employed for the purpose of creating a structure, rather than removing a component as required by the claims. Thus, Mukherjee's use of UV-irradiation does not facilitate removal of any component, much less a porogen as recited in the claims.

Applicants note that the Examiner refers to "column 4, lines 45-46' to support the rejection of claim 1. This excerpt refers to an "extraction component." Possibly, removal of the "extraction component" from the aerogel precursor material by supercritical extraction, as described, will introduce pores in the nanoporous aerogel.

However, even if this component could be viewed as a porogen, it is not removed by any process involving ultraviolet radiation, and, in fact, it is removed well before Mukherjee contemplates any use of ultraviolet radiation. Note that Mukherjee refers to UV-irradiation only at column 10, lines 17-21 (and in the identical paragraph at column 11, lines 31-50). The UV-irradiation described there is for purposes of a final curing operation, as mentioned before. At this point in the process, the "extraction component" referenced at column 4, lines 45-46 would have been removed long before.

In view of the above, applicants can discern no way in which the process described in the Mukherjee patent can map to the elements recited in claim 1, or in any other independent claim. Certainly there is no exposure of a precursor film "to ultraviolet radiation to facilitate removing the porogen from the precursor film and thereby create voids within the dielectric material to form the porous low-k dielectric material."

It is, therefore, respectfully submitted for at least the reasons stated above that claims 1, 26 and 32 are novel and patentable over Mukherjee and withdrawal of the art rejections for these claims is respectfully requested.

Claims 4-5, 8-11, 13-22, 24, 25, 27-31, and 33-37 each depend on one of claims 1, 26 or 32. Therefore, these claims are patentable over the cited prior art for at least the reasons stated

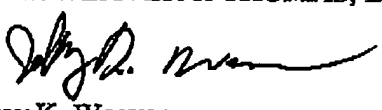
above for claims 1, 26 and 32. Withdrawal of the art rejections for these claims is respectfully requested.

Withdrawal of all rejections under 35 U.S.C. 102 is respectfully requested.

Conclusion:

In light of the foregoing amendments and remarks, Applicants respectfully submit that all pending claims are now in condition for allowance. Thus, Applicants respectfully request a Notice of Allowance from the Examiner. Should any unresolved issues remain, the Examiner is encouraged to contact the undersigned at the telephone number provided below. No fees appear to be necessary for this Amendment. However, if the Commissioner determines that any fee is due, such fee may be charged to deposit account No. 50-0388 (Order No. NOVLP075).

Respectfully submitted,
BEYER WEAVER & THOMAS, LLP



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